Use of Short Cephalomedullary Nails for Geriatric Hip Fractures Reduces Blood Loss and Need for Transfusion: A Multicenter Retrospective Analysis

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Purpose: Among the growing global burden of geriatric hip fractures, the extracapsular majority are commonly treated with cephalomedullary nails (CMNs) with short and long versions demonstrating contrasting benefits that remain controversial. The important measure of perioperative blood loss has been inaccurately reported using estimated blood loss in the literature, thereby clouding the decision-making process between short and long. Hypothesizing that use of a short CMN would confer a decrease in true blood loss, we sought to assess whether the more accurate «calculated blood loss» (CBL) based on hematocrit dilution would be lower for patients treated with short rather than long CMNs.

Methods: A retrospective comparative cohort analysis was conducted of 1442 cases of CMN fixation of geriatric (ages 60-105 years) extracapsular hip fractures (AO/OTA 31A , 31B3, and 32 fractures within 5 cm of the lesser trochanter) at two Level I trauma centers between January 1, 2009 and December 31, 2018. Patients undergoing multiple simultaneous or revision surgeries were excluded. Blood loss was calculated as previously described based on the volume required to produce the observed change in hemoglobin between pre- and postoperative measurements. Univariate comparisons between long and short nail cohorts were performed using Barnard's exact and Wilcoxon rank-sum tests, and multivariate linear regression analysis was conducted with propensity score weighting.

Results: Use of a short rather than long CMN was associated with approximately a 30% reduction in CBL and a reduction in mean operative time from 66 to 42 minutes. The absolute reduction in transfusion risk was 21%, yielding a number needed to treat of 4.8 (with a short nail to prevent one transfusion). No statistically significant difference in reoperation, periprosthetic fracture, or mortality was noted between groups.

Conclusion: Use of short compared to long CMNs for geriatric extracapsular hip fractures confers markedly reduced blood loss, need for transfusion, and operative time. In concert with prior literature demonstrating a 226% increased risk of surgical site infection following blood transfusion, our data further imply that 1 in 14 patients treated with a long nail develop a surgical site infection that would be avoided with a short nail.